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The Effect of Thiouracil on the Thyroid Gland of the Mouse

Patricia Patridge

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Always proud of its members who win state-wide recognition, the Junior Academy of Science recognizes two outstanding Junior Scientists in this issue. The prepared papers of Miss Patricia Patridge and Mr. Don Barry follow, in JUNIOR ACADEMY NEWS. Both of these high school seniors represented Iowa last December in Washington, D.C. They attended the AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE and presented their papers.

The Effect of Thiouracil on the Thyroid Gland of the Mouse:

by Miss Patricia Patridge—

Abstract

The object of this research was to determine the effect of thiouracil on the thyroid gland of the mouse.

Miss Patridge

The results showed that thiouracil caused a definite increase in the size of the gland and a decrease in the amount of iodine present in the gland. Since thiouracil is considered capable of preventing iodine from binding and producing the thyroxine molecule needed for the normal function of the gland, these results were as expected.

Procedure

Twelve mice (Webster Swiss strain) were placed in individual cages, fed and watered twice a day. The mice were divided into two groups—controls and those receiving the drug. The thiouracil was administered as a 0.1% solution in the drinking water. The controls received equal amounts of plain water.

At the end of one month the experiment was terminated and two mice were taken from each group for further study. The others were killed, the thyroids removed and weighed. Then the thyroids were fixed in Gibson's Fluid, sectioned, and slides were made. The slides were examined to compare the size of the cells and the amount of colloid in both types.

The other group was injected with I131 and twenty four hours later they were killed. The thyroids were removed and a count of radioactivity was taken to find the difference in the amount of iodine in the two types of glands.

Results

The thyroids of the controls were found to be much lighter in weight and the cells were much smaller in the controls. The amount of colloid was also greater in the controls. In the test with radioactive iodine, the controls had a much higher count.

Conclusion

Thiouracil prevents the formation of thyroxin and thus produces a condition similar to goiter.

Weight Comparison

Control A—.08g ..... Thiouracil A—.13g
Control B—.07g ..... Thiouracil B—.13g
Control C—.08g ..... Thiouracil—.11g

Comparison of Radioactivity

2nd shelf, 5 min. counting time

Sample I (background count)—
20.6 net c.p.m.

Sample II (thiouracil)—
554.6 net c.p.m.

Sample III (control)—
1,236.8 net c.p.m.

Sample IV (control)—
1,215.0 net c.p.m.

Further work will be necessary this fall. Hopes are to porduce a tumor—also better and more counts of radioactive iodine.

Miss Patridge is currently attending the North Iowa Community College, with interests in the field of home economics. In 1965 she received a grant from the National Science Foundation to work on "Inhalation bronchography and larynogagraphy."